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Highly angular dependent high-contrast grating mirror and its application for transverse-mode control of VCSELs

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Abstract

We report on the design and fabrication of a highly angular dependent high contrast grating (HCG) mirror. The modeling and experiment on amorphous-Si/SiO₂ HCG clearly show the large angular dependence of reflectivity, which enables single transverse-mode operations of large-area VCSELs. We fabricate 980 nm VCSELs with the angular dependent HCG functioning as a spatial frequency filter. We obtained the single transverse mode operation of the fabricated device in contrast to conventional VCSELs with semiconductor multilayer mirrors. (C) 2014 The Japan Society of Applied Physics

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